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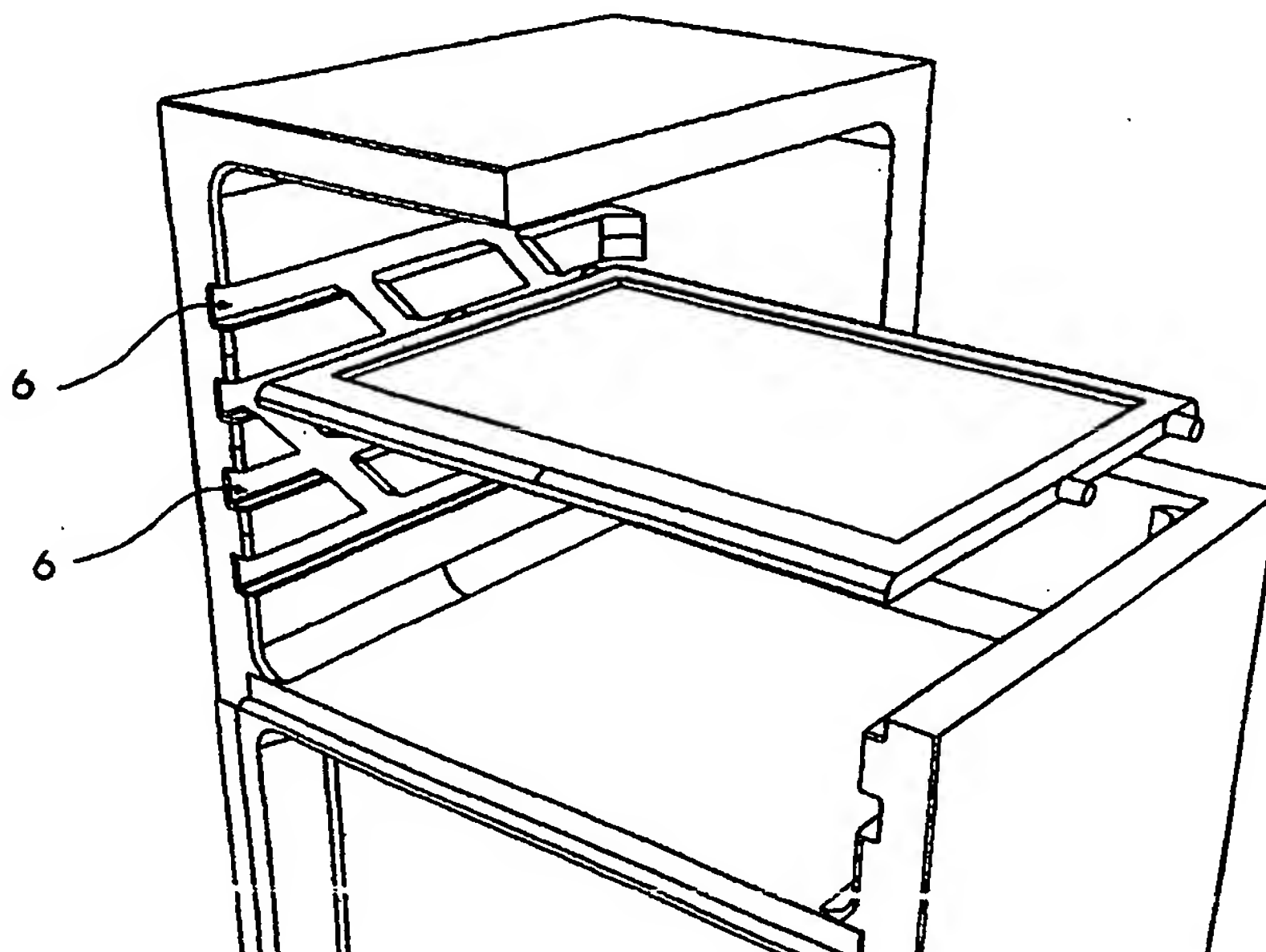
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(54) Title: A HOUSEHOLD APPLIANCE



(57) Abstract: This invention is related to a household appliance (1) preferably a refrigerator comprising shelves (2) on which articles are placed and shelf tracks (3) in which the shelves (2) can move horizontally or vertically without having to remove the items placed onto the shelf (2)

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## A HOUSEHOLD APPLIANCE

This invention is related to a household appliance preferably a refrigerator in which comprising tracks in which the shelves can be easily placed.

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In common refrigerators shelves in refrigerators are movable within the tracks provided in the body horizontally parallel to each other. In case a shelf is to be repositioned into another track, all of the items must be removed from the shelf before the shelf can be removed from its track.

10

In the state of the art, for instance in US Patent No. 5913584 and 5199778 rack gear mechanisms are defined to provide vertical movement of the shelves within the compartment. However, this kind of additional mechanisms are costly.

15 In Swiss Patent 688246, a mechanism to move the shelves vertically by means of a drive device is defined.

The object of this invention is to provide a household appliance with shelf tracks within the body to facilitate vertical or horizontal movement of the shelves.

20

The household appliance realized to attain the objects of this invention is shown in the attached drawings, in which

Figure 1 is the perspective view of the household appliance comprising a shelf  
25 track to accommodate a single shelf slot.

Figure 2 is the perspective view of the household appliance comprising a shelf track to accommodate multiple shelf slots.

Figure 3 is the exploded view of a shelf and multiple castors.

Figure 4 is the schematic view of of a shelf track including front sloped crossing  
30 tracks in which a shelf can be moved downwardly or upwardly from the junction points.

Figure 5 is the schematic view of a shelf track including rear sloped crossing tracks in which a shelf can be moved either downwardly or upwardly from the junction points.

5 Figure 6 is the schematic view of a shelf track including concave curved crossing tracks.

Figure 7 is the schematic view of a shelf track including convex curved crossing tracks.

Figure 8 is the schematic view of a shelf track including "S" formed crossing tracks.

10

Parts shown in the figures are numbered as follows :

1. Household appliance
2. Shelf
- 15 3. Shelf track
4. Horizontal tracks
5. Crossing tracks
6. Shelf slots
7. Junction point
- 20 8. Protrusion
9. Castors

The household appliance (1), preferably a refrigerator, according to this invention comprises one or more shelves (2) on which articles are placed and one or more shelf tracks (3) to support and keep the shelves (2) in which the shelves (2) can move.

The shelf track (3) comprises one or more horizontal tracks (4), one or more crossing tracks (5) to adjust the shelf (2) downwardly or upwardly and move between the horizontal tracks (4), one or more junction points (7) at which the

horizontal tracks (4) and crossing tracks (5) are met and shelf slots (6) to enable the complete removal or placement of a shelf (2).

5 The shelf (2) comprises one or more protrusions (8) at the edges that contact the shelf tracks (3) to provide movement inside the shelf track (3).

Shelf (2) is placed within the household appliance by pushing forward after the protrusions are inserted into the shelf slots (6).

10 In order to move to an upper position, the shelf (2) is pulled out until it reaches the junction points (7) and then pressed upwardly. As the horizontal track (4) is guided into the intersecting upper crossing track (5) and mounted into the next upper track (4), the shelf is pushed inside the appliance to be fully placed into the horizontal track (4).

15 Whereas, in order to move to a lower position, the shelf is pulled out until it reaches the junction points (7) then its is guided towards the crossing track (5) intersecting the lower horizontal track (4). As it is inserted into the lower track, the shelf (2) is pushed inside the appliance (1) to be fully placed into the  
20 horizontal track (4).

In an embodiment of this invention, the shelf track (3) comprises junction points (7) to guide the shelves (2) to the upper or lower horizontal tracks (4). (Figure 4).

25 In another embodiment of this invention, the shelf track (3) comprises junction points (7) to guide the shelves (2) to either upper or lower horizontal tracks (4). (Figure 5).

In another embodiment of this invention, the shelf track (3) comprises a single  
30 shelf slot (6) to provide the removal of the shelf (2) out only at a predetermined level. (Figure 1)

In another embodiment of this invention, the shelf track (3) comprises several shelf slots (6) to enable the shelf (2) to be completely pulled out from each horizontal track (4). (Figure 2)

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In another embodiment of this invention, the crossing tracks (5) are sloped frontally or rearwardly to facilitate the vertical or horizontal movement of the shelves (2) without having to remove the items placed onto the shelves (2). (Figure 4 and 5)

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In another embodiment of this invention, the crossing tracks (5) are preferably convex or concave curved to provide smooth movement and to facilitate the vertical or horizontal movement of the shelves (2) without having to remove the items placed onto the shelves (2). (Figure 6 and 7)

15

In another embodiment of this invention, the crossing tracks (5) are formed like the letter "S" to allow stepwise adjustment while the shelves (2) are moved between the horizontal tracks (4). (Figure 8)

20 In a preferred embodiment, the shelf (2) comprises one or more castors (9) to facilitate the movement of the shelf (2) within the shelf track (3).

In the preferred embodiment, the castors (9) are secured to the protrusions (8).

25 As no additional mechanism is used to adjust vertical movement of the shelves (2) according to this invention, it is inexpensive to produce.

Thus the structure of the crossing tracks (5), the user is not affected by the weight of the shelves on which storage items are placed while adjusting the height of the  
30 shelves (2).

As the shelf tracks (3) enables the repositioning of the shelves (2) without pulling the shelves completely out of the appliance, it provides an advantage in use wherein the door of the appliance cannot be fully open due to limited area of use.



**CLAIMS**

- 5        1. A household appliance (1) comprising one or more shelves to store items  
on them and characterized in that one or more shelf tracks (3) comprising  
one or more horizontal tracks (4) in which the shelves (2) can move, one  
or more vertical tracks (5) to adjust the shelf (2) downwardly or upwardly  
and one or more junction points (7) at which the horizontal tracks (4) and  
10       vertical tracks (5) are met and one or more shelf slots (6) to enable the  
complete removal or placement of a shelf (2).
2. The household appliance (1) as defined in Claim 1 characterized in that  
the shelf (2) comprises one or more protrusions (8) at the edges that  
contact the shelf tracks (3) to provide movement inside the shelf track (3).
- 15       3. The household appliance (1) as defined in Claim 1 characterized in that  
the shelf track (3) comprises junction points (7) to guide the shelves to the  
lower and upper horizontal tracks (4) while the shelf (2) is moved  
horizontally.
- 20       4. The household appliance (1) as defined in Claim 1 characterized in that  
the shelf track (3) comprises junction points (7) to guide the shelves either  
to the upper or to the lower horizontal tracks (4) while the shelf (2) is  
moved horizontally.
- 25       5. The household appliance (1) as defined in any of the above claims,  
characterized in that the shelf track (3) comprises crossing tracks (5)  
sloped frontally or rearwardly to facilitate the vertical or horizontal  
movement of the shelves (2) without having to remove the items placed  
onto the shelf (2).
- 30       6. The household appliance (1) as defined in any one of the claims from 1 to  
4 characterized in that the shelf track (3) comprises preferably convex  
and concave curved crossing tracks (5) to provide smooth movement and

to facilitate the vertical or horizontal movement of the shelves (2) without having to remove the items placed onto the shelf (2).

- 5
7. The household appliance (1) as defined in any one of the claims from 1 to 4 characterized in that the shelf track (3) comprises crossing tracks (5) formed as the letter "S" to allow a stepwise adjustment while the shelves (2) are moved between horizontal tracks (4).
8. The household appliance (1) as defined in any one of the above claims characterized in that the shelf (2) comprises one or more castors (9) to facilitate movement within the shelf tracks (3).

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Figure 1

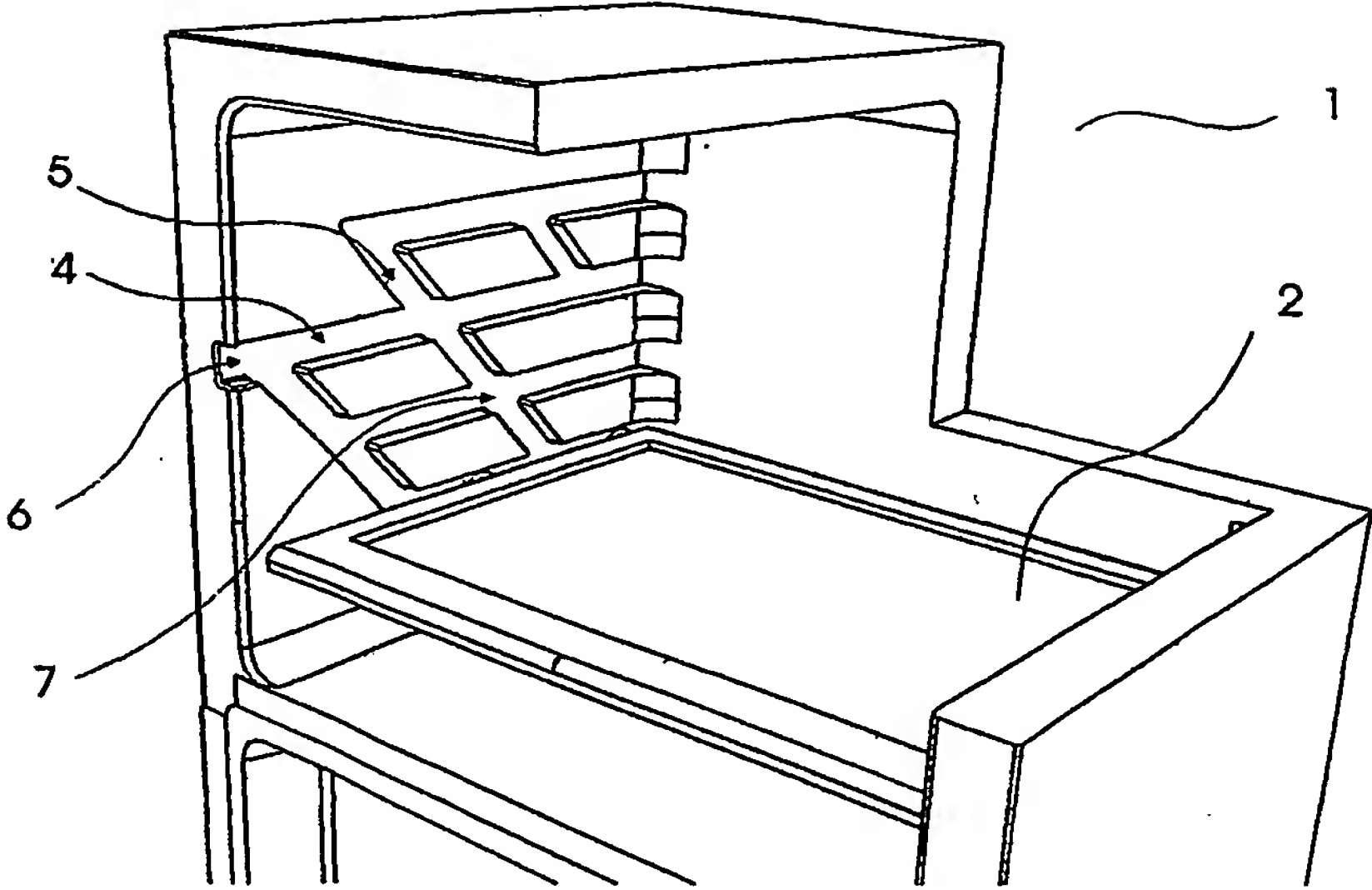


Figure 2

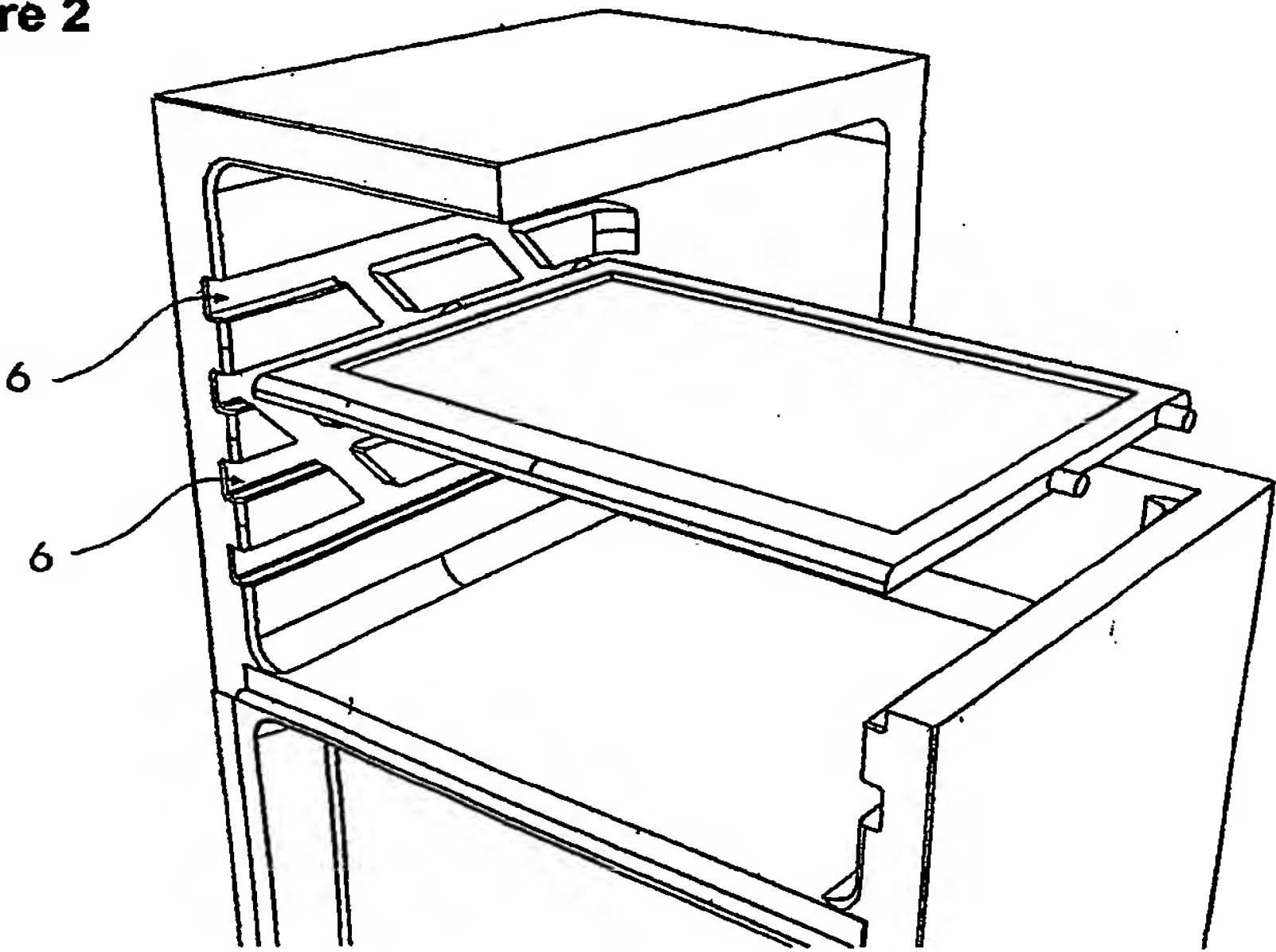


Figure 3

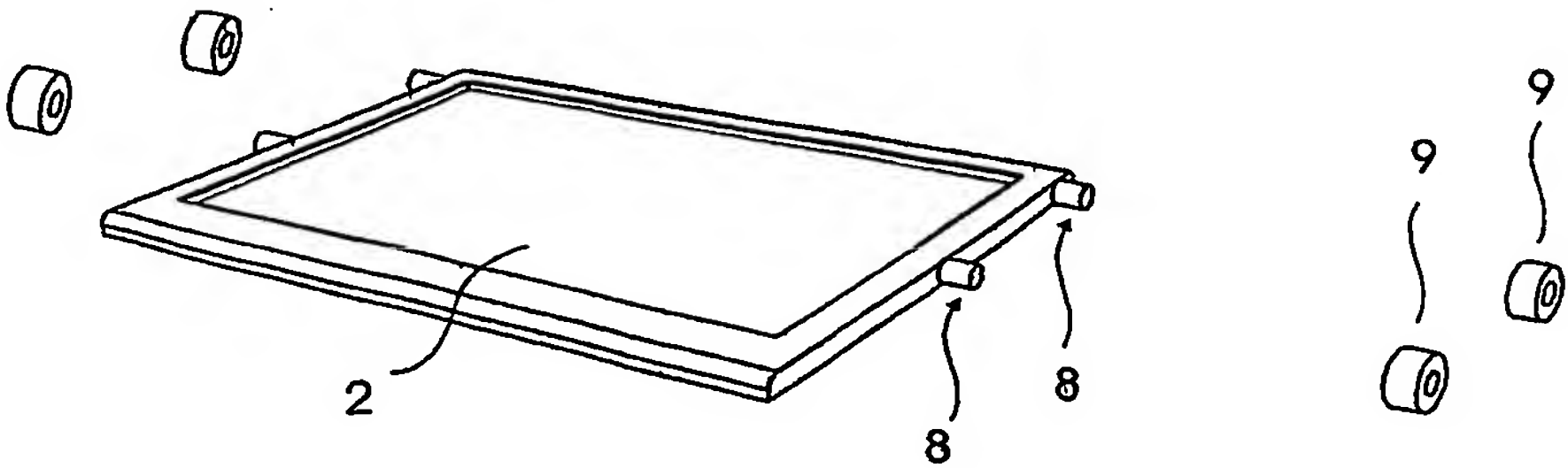


Figure 4

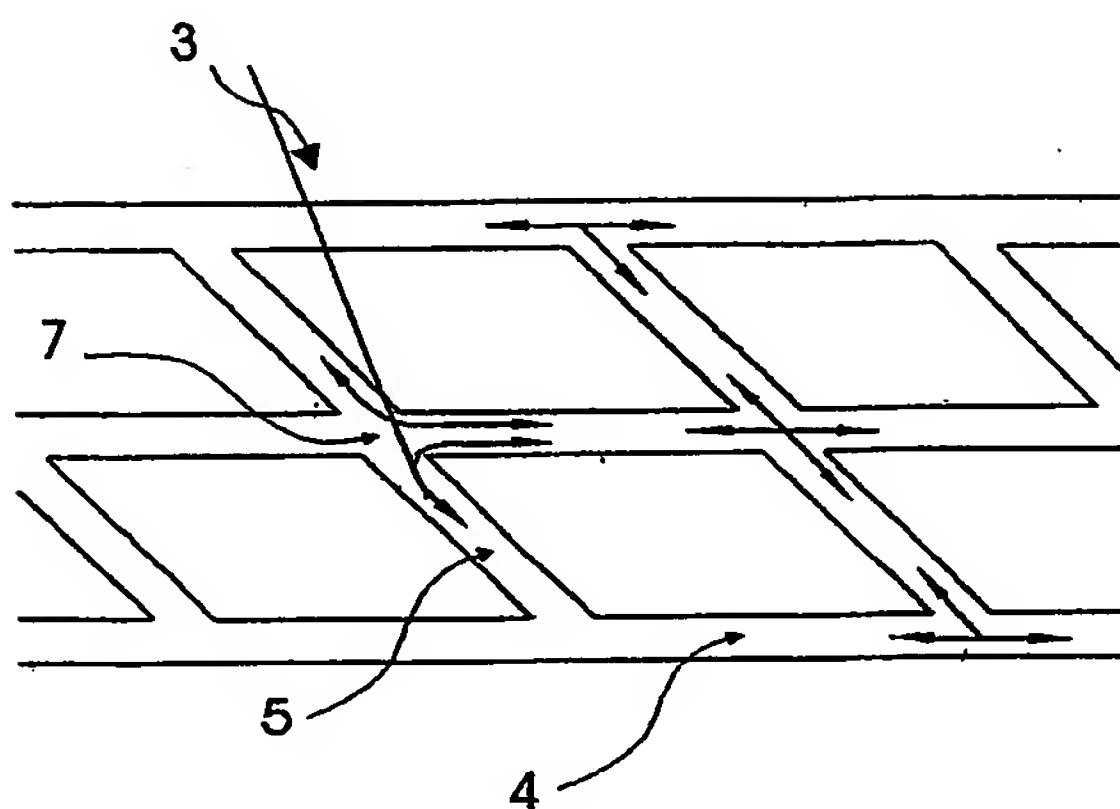


Figure 5

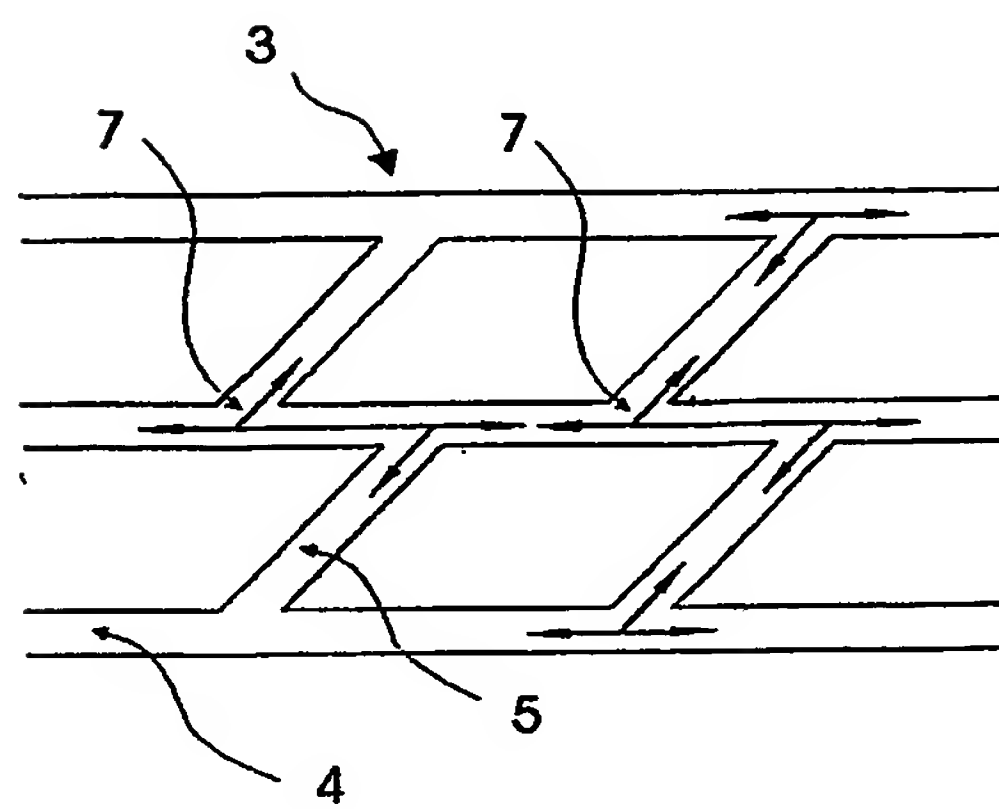


Figure 6

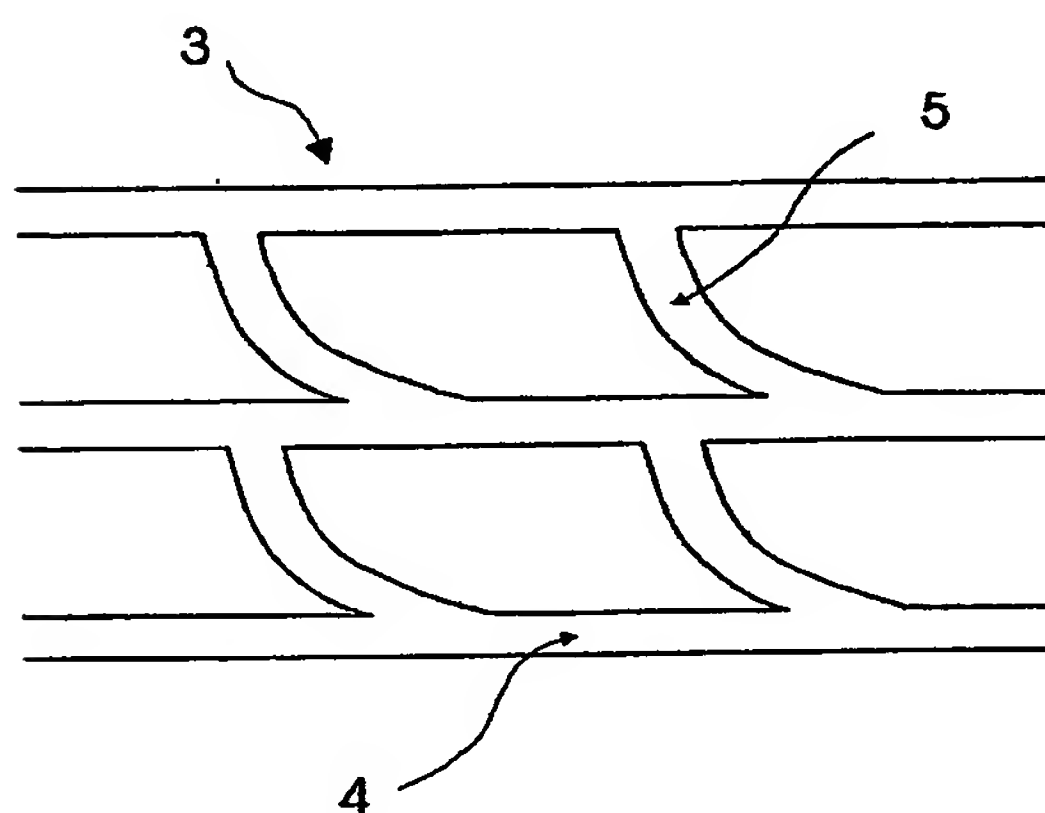


Figure 7

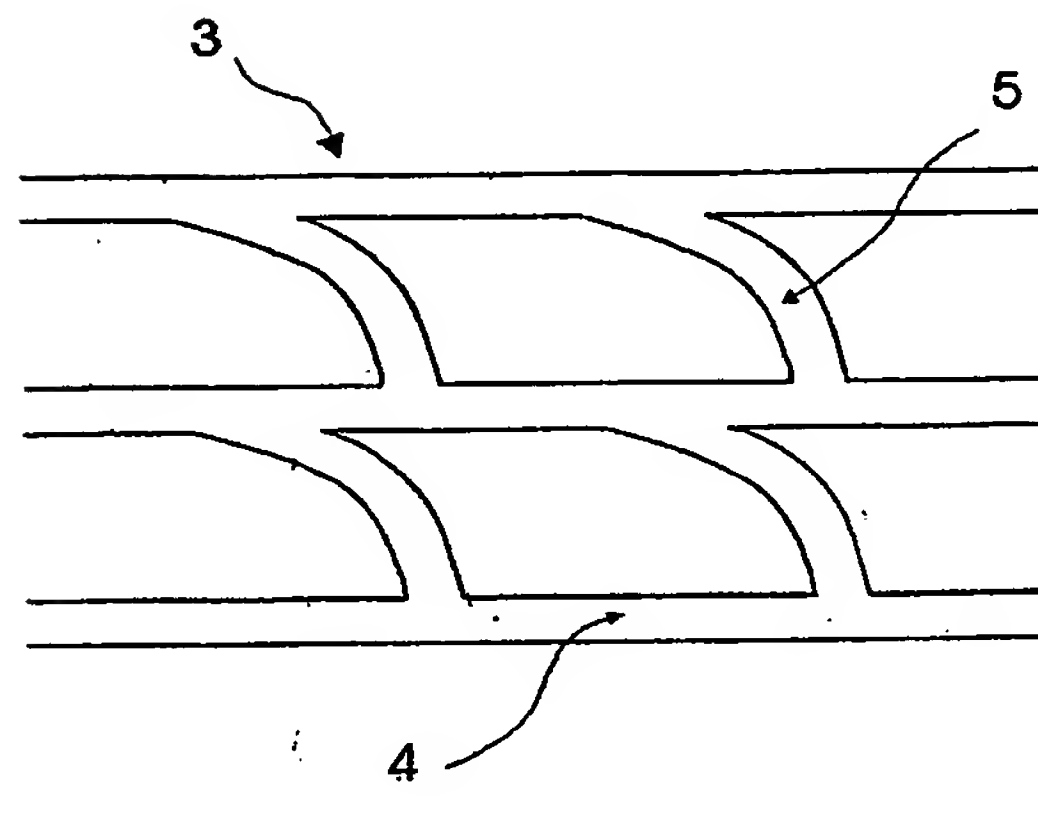
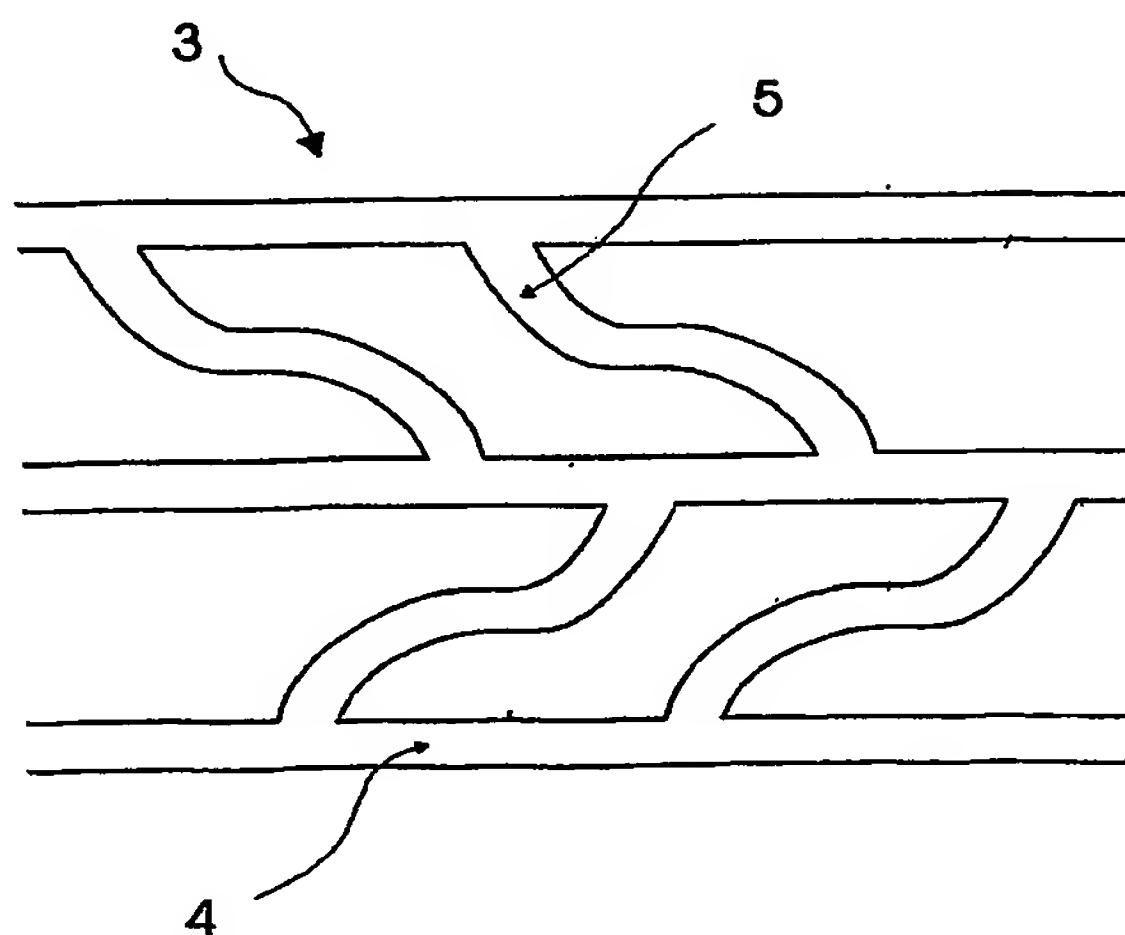


Figure 8



## INTERNATIONAL SEARCH REPORT

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**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 F25D25/02 A47B57/10

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F25D A47B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 516 369 A (BIDAK JOHN ET AL) 23 June 1970 (1970-06-23) the whole document	1-5, 8
A	---	6, 7
X	WO 84 04029 A (LARSSON KLAUS ERIK) 25 October 1984 (1984-10-25)	1-5
Y	page 2, line 1 -page 2, line 36 page 4, line 15 -page 4, line 22 claims 1-10 figures 1,2,4	8
A	---	6, 7
	--- -/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 2002, no. 07, 3 July 2002 (2002-07-03) -& JP 2002 071267 A (FUKUSHIMA INDUSTRIES CORP), 8 March 2002 (2002-03-08) abstract figures 1,2,4-9	8
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